



Serial No.: 10/601,614  
Docket No.: 805990-0112

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Applicants : Todd Thomas et al.  
Serial No. : 10/601,614  
Filing Date : June 23, 2003  
Title : COLD IN-PLACE RECYCLING OF BITUMINOUS  
MATERIAL

Group/Art Unit : 3671  
Examiner : Alexandra Pechhold  
Confirmation No. : 8806

Atty. Docket No. : 805990-0112

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Commissioner for Patents  
P.O. Box 1450  
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**APPEAL BRIEF**

In accordance with the provisions of 37 C.F.R. §41.37, Applicants submit this Appeal  
Brief in support of the Notice of Appeal filed April 28, 2006.

**I. REAL PARTY IN INTEREST**

The owner of this application is SemMaterials, L.P., 6120 South Yale, Suite 700, Tulsa,  
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## **II. RELATED APPEALS AND INTERFERENCES**

There are no related appeals or interferences.

## **III. STATUS OF CLAIMS**

This application was filed on June 23, 2003 as a continuation of Application No. 09/881,491 filed June 14, 2001, now U.S. Patent No. 6,599,057. The Application was filed with Claims 1-24 which were canceled in a Preliminary Amendment and new Claims 25-45 were added simultaneously. Claims 25-45 were amended in a paper filed October 14, 2005. Claims 39-41 have been objected to while the Examiner has indicated these Claims contain allowable subject matter. Thus, Claims 25-45 remain pending in this Application and all Claims stand finally rejected. The Claims involved in this Appeal are Claims 25-45, which are reproduced in Appendix A attached hereto.

## **IV. STATUS OF AMENDMENTS**

No amendments were filed subsequent to the final rejection. Accordingly, all amendments to be considered on appeal have been entered. The claims on appeal are reproduced in Appendix A to this brief in accordance with the amendments made to the claims as originally filed.

## **V. SUMMARY OF CLAIMED SUBJECT MATTER**

There are two independent claims that are the subject of this Appeal. These are Claims 25 and 42 (See Appendix A). Independent claim 25 is directed to a method of selecting an asphalt emulsion mixture to be used in reconstructing a paved road wherein reclaimed asphalt product (RAP) is an integral part of the paving material. The steps of the method are providing

reclaimed asphalt pavement particles, selecting an emulsion, mixing the emulsion and reclaimed particles to form a proposed asphalt mixture, testing the proposed mixture using a raveling test and a moisture susceptibility test and then selecting the final emulsion mixture after the testing of the proposed mixture.<sup>1</sup>

Claim 42 is directed to a method of reconstructing a paved road using RAP material and an emulsion. The method steps comprise forming an emulsion mixture from an emulsion and RAP particles, testing the proposed mixture using a raveling test and a moisture susceptibility test, selecting an emulsion after the aforementioned testing, removing RAP from the paved road, mixing the RAP with the selected emulsion and applying the resulting mixture to the road to form a cold in place layer.<sup>2</sup>

Claim 26 depends from Claim 25, and adds the additional limitation of testing the proposed asphalt mixture using a stability test.<sup>3</sup>

Claim 27 depends from Claim 26 and adds the additional limitation of testing the modulus of the proposed asphalt mixture.<sup>4</sup>

Claim 28 depends from Claim 27 and specifies that it is the resilient modulus of the proposed asphalt mixture which is tested.<sup>5</sup>

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<sup>1</sup> The subject matter of Claim 25 is described at page 4, lines 13-20 to page 5, line 2; page 6, lines 16-19; page 8, line 10 to page 10 thru the chart; page 11, lines 3 to 11; page 12, line 44 to page 14, line 8; and page 14, line 9 to page 15, line 5 of the specification.

<sup>2</sup> The subject matter of Claim 42 is described at page 17, lines 3 to page 18, line 2 of the specification.

<sup>3</sup> The subject matter of Claim 26 is described at page 9, line 7 to page 10, line 4 of text; page 10, line 14 of text to page 11, line 2 of the specification.

<sup>4</sup> The subject matter of Claim 27 is described at page 34, lines 1-5; page 38, lines 1-9 of the specification.

<sup>5</sup> The subject matter of Claim 28 is described at page 38, lines 4-9 of the specification.

Claim 29 depends from Claim 25 and specifies that the test step include modulus testing.<sup>6</sup>

Claim 30 depends from Claim 29 and further narrows the limitation of Claim 29 by specifying that it is resilient modulus which is tested.<sup>7</sup>

Claim 31 depends from Claim 25 and further limits the independent claim by specifying thermal cracking testing.<sup>8</sup>

Claim 32 also depends from Claim 25 and further limits the testing step by specifying both a thermal cracking and stability test.<sup>9</sup>

Claim 33 depends from Claim 25 and specifies that the emulsion is a cationic emulsifier.<sup>10</sup>

Claim 34 depends from Claim 25 and includes the additional limitation of specifying that the reclaimed asphalt particles which are provided are taken from the road.<sup>11</sup>

Claim 35 depends from Claim 34 and includes the additional step of inspecting the samples to determine the composition of layers in the samples as well as the thickness and variations between samples.<sup>12</sup>

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<sup>6</sup> The subject matter of Claim 29 is described at page 34, lines 1-5; page 38, lines 1-9 of the specification.

<sup>7</sup> The subject matter of Claim 30 is described at page 38, lines 4-9 of the specification.

<sup>8</sup> The subject matter of Claim 31 is described at page 12, lines 10-15 of the specification.

<sup>9</sup> The subject matter of Claim 32 is described at page 11, lines 12-18 and page 12, lines 10-15 of the specification.

<sup>10</sup> The subject matter of Claim 33 is described at page 7, lines 7-14 of the specification.

<sup>11</sup> The subject matter of Claim 34 is described at page 5, lines 3-12; page 8, lines 20-22 of the specification.

<sup>12</sup> The subject matter of Claim 35 is described at page 4, lines 13-20; and page 5, lines 3-12 of the specification.

Claim 36 depends from Claim 34 and specifies that the samples taken from the road are crushed to form reclaimed asphalt pavement particles.<sup>13</sup>

Claim 37 also depends from Claim 34 and specifies that the road samples are representative of variations in the road.<sup>14</sup>

Claim 38 depends directly from Independent Claim 25 and adds the limitation of requiring two different proposed emulsion mixtures to be formulated and tested.<sup>15</sup>

Claim 39 depends directly from Independent Claim 25 and specifies that the selected emulsion ravel no more than about two percent by weight after at least four of curing.<sup>16</sup>

Claim 40 depends from Claim 31 and specifies that the selected asphalt emulsion has a critical cracking temperature that is at least as low as the possible coldest temperature of the road with 98% reliability.<sup>17</sup>

Claim 41 depends from Claim 25 and specifies that the selected emulsion mixture has a retained strength of at least about 70%.<sup>18</sup>

There are three additional dependent claims in the application, all of which depend from Independent Claim 42 discussed above. Claim 43 depends from Claim 42 and adds three additional steps to the claimed method. Namely, Claim 43 specifies inspecting the road to

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<sup>13</sup> The subject matter of Claim 36 is described at page 5, lines 7-12 of the specification.

<sup>14</sup> The subject matter of Claim 37 is described at page 4, lines 16-20 of the specification.

<sup>15</sup> The subject matter of Claim 38 is described at page 22, lines 18-21; page 29, lines 8-13 of the specification.

<sup>16</sup> The subject matter of Claim 39 is described at page 12, lines 17-20 of the specification.

<sup>17</sup> The subject matter of Claim 40 is described at page 12, lines 10-15 of the specification.

<sup>18</sup> The subject matter of Claim 41 is described at page 11, lines 3-11 of the specification.

determine if it has a certain minimal thickness; determining if the road has a structurally sound base; and determining if the road has acceptably good drainage.<sup>19</sup>

Claim 44 depends from Claim 42 and adds the additional step of applying a wearing surface selected from a specified group of materials.<sup>20</sup>

Claim 45 is a product by process claim dependent from Claim 42.

## **VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

The grounds of rejection presented for review are as follows:

A. Claims 25, 26, 34-38 and 42-45 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Wirtgen (U.S. 5,741,085) in view of Kai et al. (U.S. 4,532,271) and Bond et al. (U.S. 6,203,606) or Chang et al. (U.S. 4,839,404).

B. Claims 27-30 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Wirtgen (U.S. 5,741,085); Kai et al. (U.S. 4,532,271); Bond et al. (U.S. 6,203,606) and Chang et al. (U.S. 4,839,404) for the reasons applied to Claim 25 and further in view of Kamel et al. (U.S. 5,284,509).

C. Claims 31 and 32 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Wirtgen (U.S. 5,741,085); Kai et al. (U.S. 4,532,271); Bond et al. (U.S. 6,203,606) and Chang et al. (U.S. 4,839,404) for the reasons applied to Claim 25 and further in view of Bailey et al. (U.S. 6,440,205).

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<sup>19</sup> The subject matter of Claim 43 is described at page 4, lines 10-20 of the specification.

<sup>20</sup> The subject matter of Claim 44 is described at page 19, lines 17-22 of the specification.

D. Claim 33 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Wirtgen (U.S. 5,741,085); Kai et al. (U.S. 4,532,271); Bond et al. (U.S. 6,203,606) and Chang et al. (U.S. 4,839,404) as previously applied to Claim 25 and further in view of Graf (U.S. 5,114,483).

As indicated above, Claims 39-41 have been objected to as being dependent upon a rejected claim. The Examiner has indicated these claims would be allowable if rewritten in independent form.

## **VII. ARGUMENT**

### **A. OBVIOUSNESS MUST BE ESTABLISHED FOLLOWING PTO GUIDELINES AND CASE PRECEDENT.**

While Applicants appreciate that the Board is well familiar with the criteria for determining obviousness, § 706.02(j) of the Manual of Patent Examining Procedure is set forth below for emphasis and focus. The requirements for establishing a *prima facie* case of obviousness under 35 U.S.C. § 103 are:

"(1) First, there must be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the references to arrive at the claimed invention.

(2) Second, there must be a reasonable expectation of success.



(3) Finally, the prior art references must teach or suggest all of the claim limitations."

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicants' disclosure.

**B. CONCISE STATEMENT OF CLAIMED SUBJECT MATTER**

The broadest claim which is the subject of this Appeal, namely Claim 25, is set forth below in summary fashion to provide a ready reference for discussing novelty and non-obviousness:

Claims on Appeal  
Thomas et al.

- providing reclaimed particles
- selecting an emulsion
- mixing emulsion and particles for proposed mixture
- testing mixture using raveling and moisture susceptibility test
- selecting mixture after testing

The essence of the claimed invention is the steps of selecting an emulsion, mixing the emulsion with RAP particles to present a proposed mixture, testing the proposed mixture using raveling and moisture susceptibility tests, and then selecting the final mixture after completion of the testing step.

Since the only basis for rejection of the claims is under § 103 of the statute, novelty of the invention is acknowledged; it is strictly a question of non-obviousness.



**C. A *PRIMA FACIE* CASE OF OBVIOUSNESS OF CLAIMS 25, 26, 34-38 AND 42-45  
BASED ON THE PRIMARY REFERENCE WIRTGEN IN VIEW OF KAI ET AL. AND BOND  
ET AL. OR CHANG ET AL. HAS NOT BEEN ESTABLISHED.**

**1. Claim 25**

The Examiner has relied on the primary reference, Wirtgen '085, in rejecting the independent claims, although acknowledging that Wirtgen does not teach all of the steps and therefore relying upon secondary references as well.

The Examiner has made two fundamental errors in interpreting the Wirtgen reference. First, the Examiner has stated in the Final Rejection of December 29, 2005, at page 2, paragraph number 2, "The Applicants' first three steps are disclosed by Wirtgen in Claim 11." This is incorrect. Claim 11 of Wirtgen, cited by the Examiner, calls for "analyzing a sample of the crushed road material and determining materials to be added thereto in amounts necessary to obtain a composition of the road surface to be renewed." This statement is further explained in the Wirtgen specification at column 2, lines 38-45. Wirtgen makes it clear that the road surface to be repaired is sampled and analyzed, and the data obtained are fed into a computer which then determines the materials to be added to the mix. This is contrasted with the steps called for by the present Applicants' Claim 25 which are providing RAP particles, selecting an emulsion, mixing the emulsion and the RAP particles into a proposed mixture, then testing the proposed mixture and selecting the final mixture based on the test. Thus, while the prior art teaches testing the RAP particles before any emulsion is selected, the present Applicants' claims specify testing only *after* an emulsion has first been selected and then *mixed* with the RAP. This is directly contrary to the Wirtgen teachings.

The second fundamental error made by the Examiner in applying the Wirtgen reference is found in the last sentence of the paragraph numbered 2, page 2 of the Final Rejection wherein it is stated "Wirtgen also discloses selecting the mixture to be used after testing the mixture for performance, since Wirtgen states in column 2, lines 38-50 that sampling and analysis are performed and that a preprocessed material is obtained which shows optimum composition." This quotation from column 2 of the Wirtgen reference is taken out of context and does not represent the true Wirtgen teachings. At column 2, lines 38-50, it is true that Wirtgen states "the composition of the road surface to be repaired is suitably found by sampling and analysis". This statement is further explained, however, at column 4, line 64 where Wirtgen states, "By sampling and analysis of the old road surface performed before the recycling process, the composition of it was exactly determined, and in accordance with this composition the addition component was added . . . ." Thus, Wirtgen makes it abundantly clear that the sampling and analysis which is conducted is of **the old road surface** and is performed *before* the recycling process begins for the purpose of determining the composition of the old road surface. Wirtgen is **not** teaching or suggesting the steps of first selecting an emulsion and mixing it with RAP to form a *proposed* emulsion mixture **followed by** testing the proposed mixture for performance and then selecting the final mixture based upon the testing.

Set forth below is the previously presented summation of Claim 25 and a summary of the teachings of Wirtgen '085 presented in a corresponding manner.

<u>Claims on Appeal</u> <u>Thomas et al.</u>	<u>Wirtgen '085</u>
<ul style="list-style-type: none"><li>• providing reclaimed particles</li><li>• selecting an emulsion</li><li>• mixing emulsion and particles for proposed mixture</li><li>• testing mixture using raveling and moisture susceptibility test</li><li>• selecting mixture after testing</li></ul>	<ul style="list-style-type: none"><li>• Y – provides reclaimed particles</li><li>• Y – selects an emulsion</li><li>• N – mix but not for proposed mixture.</li><li>• N – no testing of proposed mixture. Sampling and analysis of RAP only</li><li>• N – no selection based on testing</li></ul>
Y=claimed limitation present	
N=claimed limitation not present	

While the Examiner has acknowledged that Wirtgen fails to teach at least two of the steps called for by Independent Claim 25, the Examiner's misstatements regarding the teachings of Wirtgen undermine the primary basis for the obviousness rejection. The obviousness rejection cannot stand because of these fundamental errors in applying the primary reference.

The Examiner cites the Kai reference for the teaching of testing a paving material using a raveling test. It is true that Kai teaches a raveling test for use in pavement analysis, but there is no other teaching which is relevant to the patentability of Claim 25. Specifically, Kai is dealing solely with virgin paving material, the teachings applicable to which are far different from the teachings which are applicable to RAP paving. Second, Kai does not teach the use of an emulsion, but rather is using a phenolic resin additive. Kai does not teach mixing a proposed emulsion mixture and likewise does no testing of a proposed emulsion mixture. It is significant that the only testing Kai teaches is with regard to the final paving materials; not of a proposed mixture as claimed by the present Applicants. Kai also teaches only a raveling test, not the combination of a raveling and moisture susceptibility test. Set forth below is the previously presented summation of Claim 25 and a corresponding summary of the teachings of Wirtgen and Kai '271.

Claims on Appeal <u>Thomas et al.</u>	<u>Wirtgen '085</u>	<u>Kai '271</u>
• providing reclaimed particles	• Y – provides reclaimed particles	• N – virgin paving material
• selecting an emulsion	• Y – selects an emulsion	• N – uses phenolic resin
• mixing emulsion and particles for proposed mixture	• N – mix but not for proposed mixture.	• N – no mixing of proposed emulsion mixture
• testing mixture using raveling and moisture susceptibility test	• N – no testing of proposed mixture. Sampling and analysis of RAP only	• N – raveling test only
• selecting mixture after testing	• N – no selection based on testing	• N – no selecting based on testing

Y=claimed limitation present  
N=claimed limitation not present

As shown by this comparison, Kai does not teach any of the steps called for by Claim 25. Kai supplies none of the deficiencies of the Wirtgen reference previously discussed other than the disclosure of a raveling test, which the present Applicants have never claimed to be novel per se. It is the process of selecting an emulsion, mixing the emulsion and RAP for a proposed mixture, followed by testing of the mixture and then selecting of the final mixture after testing that comprises the novelty of the present Applicants' claimed invention. Wirtgen and Kai together do not teach the claimed invention. Application of a raveling test to virgin pavement after it is in place per the Kai reference is not even close to the claimed method.

Finally, the Examiner has relied upon Bond and Chang for teaching that a moisture susceptibility test can be used with asphalt paving material. This is true; however, there is no teaching in Bond or Chang of applying a moisture susceptibility test in the manner specified in Claim 25. Bond and Chang are both dealing with virgin paving material, a notably different

product than the RAP specified in Claim 25. Bond utilizes recycled oil as an additive. Chang utilizes a copolymer. Neither teaches utilizing an emulsion. Thus, there is no mixing of a proposed emulsion mixture which is subsequently tested. Both Bond and Chang teach moisture susceptibility testing but do not indicate any need for a raveling test. Since neither of these references teach moisture susceptibility and raveling testing of an emulsion, there is certainly no teaching of selecting an emulsion mixture based on such testing *prior* to paving.

Set forth below is the previously presented summation of Applicants' Claim 25 and a corresponding summary of the teachings of each of Wirtgen, Kai, Bond and Chang.

<u>Claims on Appeal</u> <u>Thomas et al.</u>	<u>Wirtgen '085</u>	<u>Kai '271</u>	<u>Bond '606/Chang '404</u>
• providing reclaimed particles	• Y – provides reclaimed particles	• N – virgin paving material	• N – virgin paving material
• selecting an emulsion	• Y – selects an emulsion	• N – uses phenolic resin	• N – uses recycled oil (Bond) or organic copolymer (Chang)
• mixing emulsion and particles for proposed mixture	• N – mix but not for proposed mixture.	• N – no mixing of proposed emulsion mixture	• N – no mixing of proposed emulsion mixture
• testing mixture using raveling and moisture susceptibility test	• N – no testing of proposed mixture. Sampling and analysis of RAP only	• N – raveling test only	• N – moisture susceptibility test only
• selecting mixture after testing	• N – no selection based on testing	• N – no selecting based on testing	• N – no selecting based on testing

Y=claimed limitation present  
N=claimed limitation not present

**2. Claim 26**

Claim 26 adds to the method of Claim 25 the additional step of performing a stability test. The Examiner has cited the Kai reference discussed above for disclosing a stability test. This is true. However, the stability test called for in the Kai reference is performed on the actual paving material. This is virgin paving material, not RAP as called for by the present Applicants' claims. Kai does not disclose the use of an emulsion and does not disclose the need for both moisture susceptibility and raveling testing. Most important of all, Kai does not contemplate mixing an emulsion with RAP to form a *proposed* emulsion mixture, then performing moisture susceptibility, raveling and stability tests prior to making a final mixture selection. While there is absolutely nothing in Kai to suggest that the teachings are applicable to RAP paving, and thus the combination of Kai with Wirtgen is not proper, the fact is that combining the references still falls far short of the claimed subject matter.

**3. Claim 34**

Claim 34 specifies the additional steps of taking samples of the road and using the samples to make the reclaimed asphalt pavement particles. The Examiner has rejected Claim 34 citing Wirtgen for disclosing that sampling and analysis on the pavement can be performed. As previously pointed out, however, Wirtgen is sampling and analyzing the RAP material *before* formulating the paving emulsion mixture. This is directly contrary to Applicants' Claim 34 which specifies that you first provide RAP, then select an emulsion, then mix the emulsion and the RAP to form a proposed asphalt emulsion mixture, followed by testing of the proposed mixture and then selecting the final mixture based on the test. Wirtgen does not just fall short of teaching the claimed invention set forth in Claim 34, he teaches proceeding contrary to the



claimed invention by requiring that the testing be done *before* any selection of components is made.

**4. Claim 35**

Claim 35 calls for the additional step of inspecting the samples to determine the composition of layers in the samples, the thickness of the layers, and variations between the samples. The Examiner again refers to the same portion of the Wirtgen reference, namely, Column 2, Lines 37-39 which has previously been relied upon. As previously pointed out, Wirtgen makes it very clear in the subsequent text at Column 4, Line 64, that the sampling and analysis is being done on the old road surface before the recycling process begins. This is not what the present Applicants are calling for and Claim 35 does not read on the Wirtgen process. Claim 35 requires collecting RAP samples, inspecting the samples to determine layer composition, thickness and variations followed by selecting an emulsion, then mixing the emulsion with RAP to form a proposed mixture, followed by testing of the mixture prior to final selection of the paving material. Wirtgen does not disclose this; Wirtgen does not teach this; Wirtgen does not suggest this.

**5. Claim 36**

Claim 36 calls for the additional step of crushing the samples to form the RAP particles. The Examiner cites Wirtgen for the disclosure of crushing reclaimed asphalt to form the RAP material. The present Applicants do not claim that it is novel, per se, to crush reclaimed material to form a suitable paving mixture. Claim 36 is novel and not obvious because Wirtgen, standing alone or in combination with the other cited references, does not contemplate crushing RAP particles, mixing an emulsion and the crushed RAP to form a proposed mixture followed by testing the mixture for both raveling and moisture susceptibility and then selecting the final mixture based upon the testing.



**6. Claim 37**

Claim 37 adds the additional step of taking representative samples from variations in the road. The Examiner again cites Wirtgen for the teaching of taking representative samples from variations in a road that is the subject of RAP reconstruction. As has previously been pointed out, however, Wirtgen specifically teaches sampling and analysis of the RAP particles followed by formulation and then repaving. This is completely contrary to the invention claimed in Claim 37 which specifies taking RAP samples from variations in the road, selecting an emulsion, mixing the emulsion and the RAP for a proposed mixture followed by testing using raveling and moisture susceptibility and then selecting the final mixture based upon the tests.

**7. Claim 38**

This claim adds the limitation to the steps of Claim 25 of requiring two different proposed asphalt mixtures, testing both, and then making a selection of the final mixture. The Examiner has again cited Wirtgen stating that while Wirtgen does **not** disclose testing and performance analysis of two different mixtures, it would, the Examiner believes, have been obvious to modify the Wirtgen procedure to formulate at least two different mixtures. What the Examiner has failed to recognize, however, is the two fundamental errors he has made in interpreting the Wirtgen reference. Wirtgen teaches only that the RAP particles from the old roadway surface can be sampled and analyzed prior to formulating the final mixture. Wirtgen does not first form a proposed mixture using a selected emulsion, Wirtgen does not test a single proposed mixture, let alone two as specified by Claim 38, and Wirtgen does not make a final selection based upon testing of two different proposed mixtures. Wirtgen only tests the initial RAP. This is done before the recycling process begins and before any emulsion is selected. This is directly contrary to the steps specified in Claim 38.

**8. Claim 42**

Claim 42 is the second independent claim and was included in the group of claims rejected on the basis of Wirtgen, Kai, Bond and Chang. In rejecting Claim 42, the Examiner states that, "The Applicants' first step is disclosed by Wirtgen in Claim 11." This is not correct. Wirtgen's Claim 11 calls for milling the road surface, analyzing a sample of the RAP, determining the necessary additives, then adding crushed mineral and paving the road. Wirtgen does not teach or suggest forming a proposed emulsion mixture as called for by Claim 42 and never does any analysis or testing on anything other than the RAP material. Specifically, Wirtgen does not test a proposed asphalt mixture comprised of RAP and an emulsion as required by Claim 42 and does not make a selection of the final emulsion mixture based upon testing of the proposed mixture. Wirtgen is testing the RAP, coming up with the formulation based on this test, and then paving. This is not what is claimed in Claim 42 and Claim 42 is not obvious in view of the Wirtgen teachings since the claimed steps are contrary to the Wirtgen teachings. As noted previously, even when Kai, Bond and Chang are added to the mixture, the crucial steps aforementioned are neither taught nor suggested.

**9. Claim 43**

Claim 43 adds to the method of Claim 42 the steps of inspecting the road, determining if it has a structurally sound base and determining if it has good drainage. While the Examiner recognizes that Wirtgen fails to specifically disclose the step of determining the road thickness, he does disclose sampling and analysis of the road surface. As previously noted, however, this is all Wirtgen teaches. He does not remotely suggest the additional steps of Claim 43 which require selecting an emulsion, mixing the emulsion and the RAP for a proposed mixture followed by testing of the proposed mixture using both raveling and moisture susceptibility

analyses and then making the final selection based on these tests. These are the essential steps of Applicants' Claim 43.

**10. Claim 44**

Claim 44 adds the limitation to the method of reconstructing a road claimed in Claim 42 of applying a wearing surface selected from a specified group of materials. While Wirtgen does specify that a cover layer of new road material may be applied to the reconstructed RAP paving, this does not meet the limitations of Claim 42 which include forming the proposed mixture and then selecting the final mixture based upon testing of the proposed mixture.

**11. Claim 45**

Claim 45 is a product by process claim dependent from Claim 42. It is allowable for the reasons discussed above in conjunction with Claim 42.

**D. A *PRIMA FACIE* CASE OF OBVIOUSNESS OF CLAIMS 27-30 BASED UPON THE REFERENCES WIRTGEN, KAI, BOND AND CHANG PREVIOUSLY DISCUSSED AND FURTHER IN COMBINATION WITH THE KAMEL ET AL. '509 PATENT HAS NOT BEEN ESTABLISHED.**

Claim 27 is dependent from Claims 25 and 26 which have been discussed above. Claim 27 adds the additional step of testing modulus of the proposed asphalt emulsion prior to making the selection of the final emulsion mixture. Claim 28 narrows Claim 27 by specifying that it is resilient modulus that is tested. Claims 29 and 30 add the modulus testing and resilient modulus testing steps to Claim 25 without including the limitation of Claim 26. The Examiner cites Kamel for the teaching that resilient modulus is an appropriate test for asphalt pavement. This is correct. Applicants do not claim novelty per se in testing resilient modulus. What the Kamel '509 patent teaches is that resilient modulus is a proper test for asphalt pavement. What Kamel does not teach, even when combined with the other references previously relied on, are the steps

of selecting an emulsion, mixing the emulsion with RAP to form a proposed paving mixture, testing the proposed mixture for raveling, moisture susceptibility *and resilient modulus* and then making a final mixture selection after the testing. This is the Applicants' claimed invention. There is no suggestion in any of the references relied on of the specific method steps called for in Claims 27, 28, 29 and 30.

**E. A PRIMA FACIE CASE OF OBVIOUSNESS OF CLAIMS 31 AND 32 BASED UPON WIRTGEN, KAI, BOND AND CHANG AS PREVIOUSLY APPLIED IN VIEW OF BAILEY '205 HAS NOT BEEN ESTABLISHED.**

Claim 31 depends from Claim 25 and adds the limitation of testing the proposed emulsion mixture for cracking prior to the selecting step. Claim 32 also depends from Claim 25 and adds thermal cracking and stability testing to the raveling and moisture susceptibility testing specified by the independent claim.

The Examiner has cited the Bailey '205 patent in combination with the other references previously discussed in rejecting Claims 31 and 32. It is true that Bailey discloses testing which could be interpreted as indicative of thermal cracking resistance. Bailey, however, is only concerned with virgin paving material and does not address RAP paving. The two are so different that it is not predictable that the science applicable to virgin paving can be applied to RAP paving. Moreover, the present Applicants do not claim novelty in testing for thermal cracking per se. The fact is Bailey not only does not contemplate RAP paving, he does not suggest use of an emulsifier and does not remotely contemplate forming a proposed emulsion mixture and testing for moisture susceptibility, raveling, as well as thermal cracking and stability before making a final selection for a RAP paving material. This is the essence of Applicants' claimed novelty in Claims 31 (thermal cracking only) and 32 (thermal cracking and stability).

**F. A PRIMA FACIE CASE OF OBVIOUSNESS OF CLAIM 33 BASED UPON WIRTGEN, KAI, BOND AND CHANG AS PREVIOUSLY APPLIED WITH THE ADDITION OF GRAF '483 HAS NOT BEEN ESTABLISHED.**

Claim 33 further limits the method of Claim 25 by specifying that the selected asphalt emulsion include a cationic emulsifier. The Examiner has cited Graf '483 as rendering Claim 33 obvious since Graf states that the Asphalt emulsions which are the subject of his disclosure "break rapidly when mixed with aggregate." Graf also teaches in Claim 1 that an emulsifier may be used in the composition. It is more significant what Graf does not teach, however, since the present Applicants do not claim that using an emulsifier in an emulsified mixture is novel per se. It is novel, in combination with the other steps of Claim 33 which include selecting an emulsion, mixing the emulsion and RAP to form a proposed emulsion mixture, testing the proposed mixture for performance and then selecting the final mixture after the testing. These steps are nowhere suggested by Graf and, as discussed above, are also neither taught nor suggested by Wirtgen. Wirtgen's teachings are in fact contrary as previously discussed and this contraindication is not overcome by adding the Graf reference.

**G. CLAIMS 39-41 CONTAIN ALLOWABLE SUBJECT MATTER.**

Claims 39-41 are objected to because of their dependency from a rejected claim.

As previously indicated, the Honorable Examiner indicated Claims 39-41 would be allowed if rewritten in independent form.

## VIII. APPENDICES

Attached hereto is the following appendix:

Appendix A - Claims on Appeal

## IX. CONCLUSION

The appropriateness of the Examiner's rejection of all of the pending claims on the basis of §103 obviousness hinges upon a correct interpretation of the Wirtgen reference. Applicants have repeated below the chart showing the claimed subject matter versus the Wirtgen disclosure.

Claims on Appeal <u>Thomas et al.</u>	<u>Wirtgen '085</u>
<ul style="list-style-type: none"><li>• providing reclaimed particles</li><li>• selecting an emulsion</li><li>• mixing emulsion and particles for proposed mixture</li><li>• testing mixture using raveling and moisture susceptibility test</li><li>• selecting mixture after testing</li></ul>	<ul style="list-style-type: none"><li>• Y – provides reclaimed particles</li><li>• Y – selects an emulsion</li><li>• N – mix but not for proposed mixture.</li><li>• N – no testing of proposed mixture. Sampling and analysis of RAP only</li><li>• N – no selection based on testing</li></ul>
Y=claimed limitation present	
N=claimed limitation not present	

It is respectfully submitted that the Examiner erred in equating Wirtgen's sampling and analysis steps to the present Applicants' claimed sampling and analysis. Wirtgen analyzed only the RAP material. The present Applicants' claims call for selecting an emulsion, mixing it with RAP particles and then testing the *proposed* mixture. The Examiner further erred in stating that Wirtgen disclosed selecting a proposed mixture to be used after testing the mixture for performance. Wirtgen does not sample and test the mixture, he only samples and tests the RAP. This is not the same as testing a proposed mixture and then making a final selection based on the tests as is claimed.



For the foregoing reasons, the Final Rejection of Claims 25-45 of the pending application should be reversed and the claims allowed.

Enclosed is the statutory fee of \$500 for filing of this Brief. The Commissioner is hereby authorized to charge any additional fees which may be required or credit any overpayment to Deposit Account 19-4409.

Respectfully submitted,

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6-22-06





## CLAIMS APPENDIX

25. A method of selecting an asphalt emulsion mixture to be used for reconstructing a paved road, comprising:

providing reclaimed asphalt pavement particles;

selecting an emulsion;

mixing said emulsion and said reclaimed asphalt pavement particles to form a proposed asphalt emulsion mixture;

testing said proposed asphalt emulsion mixture for performance using a raveling test and a moisture susceptibility test; and

selecting said asphalt emulsion mixture to be used for reconstructing said paved road after testing said proposed asphalt emulsion mixture for performance.

26. The method of claim 25, further comprising:

testing said proposed asphalt emulsion mixture for performance using a stability test; and

selecting said asphalt emulsion mixture to be used for reconstructing said paved road after testing said proposed asphalt emulsion mixture for performance.

27. The method of claim 26, further comprising:

testing modulus of said proposed asphalt emulsion mixture; and

selecting said asphalt emulsion mixture to be used for reconstructing said paved road after testing modulus of said proposed asphalt emulsion mixture.

28. The method of claim 27, wherein resilient modulus is tested.

29. The method of claim 25, further comprising:

testing modulus of said proposed asphalt emulsion mixture; and

selecting said asphalt emulsion mixture to be used for reconstructing said paved road after testing modulus of said proposed asphalt emulsion mixture.

30. The method of claim 29, wherein resilient modulus is tested.

31. The method of claim 25, further comprising:

testing said proposed asphalt emulsion mixture for performance using a thermal cracking test; and

selecting said asphalt emulsion mixture to be used for reconstructing said paved road after testing thermal cracking of said proposed asphalt emulsion mixture.

32. The method of claim 25, further comprising:

testing said proposed asphalt emulsion mixture for performance using a thermal cracking test and a stability test; and

selecting said asphalt emulsion mixture to be used for reconstructing said paved road after testing thermal cracking of said proposed asphalt emulsion mixture.

33. The method of claim 25, wherein said selected asphalt emulsion mixture comprises a cationic emulsifier.

34. The method of claim 25, further comprising:

taking samples of said road; and

using said samples to make said reclaimed asphalt pavement particles.

35. The method of claim 34, further comprising:

inspecting said samples to determine the composition of layers in said samples, the thickness of said layers, and variations between samples.

36. The method of claim 34, wherein said samples are crushed to form reclaimed asphalt pavement particles.

37. The method of claim 34, wherein said samples are representative of variations in the road.

38. The method of claim 25, wherein at least two different proposed asphalt emulsion mixtures are formulated and tested for performance before said asphalt emulsion mixture to be used for reconstructing said paved road is selected.

39. The method of claim 25, wherein said selected asphalt emulsion mixture ravel no more than about 2% by weight after curing for at least about 4 hours.

40. The method of claim 31, wherein said selected asphalt emulsion mixture has a critical cracking temperature that is at least as low as the possible coldest temperature of said road with 98% reliability.

41. The method of claim 25, wherein said selected asphalt emulsion mixture has a retained strength, as determined by a moisture susceptibility test, of at least about 70%.

42. A method of reconstructing a paved road, comprising:

forming a proposed asphalt emulsion mixture from an emulsion and reclaimed asphalt pavement particles;

testing said proposed asphalt emulsion mixture for performance using a raveling test and a moisture susceptibility test; and

selecting an asphalt emulsion mixture to be used for reconstructing said paved road after testing said proposed asphalt emulsion mixture for performance;

removing pavement from said road to form reclaimed asphalt pavement particles, leaving at least about an inch of said pavement on said road;

mixing said reclaimed asphalt pavement particles from said road with an emulsion to form said selected asphalt emulsion mixture; and

applying said selected asphalt emulsion mixture to said partially reclaimed road so as to form a cold in-place recycling layer on said road.

43. The method of claim 42, further comprising:

inspecting said road to determine if said road is thick enough to leave at least about an inch base of pavement after removing pavement;

determining if said road has a structurally sound base; and

determining if said road has good drainage.

44. The method of claim 42, further comprising:

applying to said cold in-place recycling layer a wearing surface selected from the group consisting of a cold, hot, or warm mix overlay, a seal coat, a chip seal, a fog seal, or other surface treatment.

45. The product of the process of claim 42.